

IN THE CLAIMS

1. (Currently Amended) A dehydroxylated mesoporous silica film prepared from a surfactant containing solution, having a dielectric constant less than 3 that has both a relative stability, wherein a dielectric constant increases no more than approximately 20% when the film is taken from an equilibrated condition of 0.0% relative humidity or vacuum to an equilibrated condition of 50% relative humidity, and an absolute stability, wherein the dielectric constant remains less than 3 under any conditions including humid conditions of at least 40% relative humidity, a film thickness from about 0.1 μm to about 1.5 μm , and an average pore diameter less than or equal to about 20 nm.

2. (Previously Presented) The mesoporous silica film as recited in claim 1, wherein said average pore diameter is less than or equal to about 10 nm.

3. (Previously Presented) The mesoporous silica film as recited in claim 1, wherein said thickness has a standard deviation less than $\pm 5\%$.

4. (Previously Presented) The mesoporous silica film as recited in claim 1, wherein the porosity of said mesoporous silica film is disordered, lacking a regular geometric arrangement of pores, and characterized by an x-ray diffraction peak between about 0.75 and about 2 degrees 2-theta or by the absence of an x-ray diffraction peak in the range from 2-6 degrees 2-theta.

5. (Canceled)

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12-52 previously cancelled as non-elected claims.

53. (Currently Amended) A mesoporous silica film characterized by:

a disordered porosity, lacking a regular geometric arrangement of pores, and characterized by an x-ray diffraction peak between about 0.75 and about 2 degrees 2-theta or by the absences of an x-ray diffraction peak in the range of 2-6 [degrees] degrees 2-theta;

a dielectric constant less than 3.0 that is stable, wherein a stable film has at least one of either relative stability, wherein a dielectric constant increases no more than approximately 20% when the film is taken from an equilibrated condition of 0.0% relative humidity or vacuum to an equilibrated condition of 50% relative humidity, or absolute stability, wherein the dielectric constant remains less than 3 under any conditions including humid conditions of at least 40% relative humidity;

a film thickness from about 0.1 μm to about 1.5 μm ; and

an average pore diameter less than or equal to about 20 nm.

54. (Canceled)

55. (Currently Amended) A surfactant-templated mesoporous dielectric film on a substrate prepared by evaporation from silica precursors having greater than eight carbon atoms for every one silica atom and a surfactant characterized by:

a dielectric constant less than 3.0 that is stable, wherein a stable film has at least one of either relative stability, wherein a dielectric constant increases no more than approximately 20% when the film is taken from an equilibrated condition of 0.0% relative humidity or vacuum to an equilibrated condition of 50% relative humidity, or absolute stability, wherein the dielectric constant remains less than 3 under any conditions including humid conditions of at least 40% relative humidity;

a film thickness from about 0.1 μm to about 1.5 μm ; and

an average pore diameter less than or equal to about 20 nm.

57-65 previously cancelled as non-elected claims.

66. (Canceled)

67. (Canceled)

68. (Canceled)

69. (Canceled)

70. (Canceled)

71-74 previously cancelled as non-elected claims.

75. (Currently Amended) A surfactant-templated ~~dehydroxylated~~ mesoporous dielectric film on a substrate prepared from a silica precursor solution by evaporation, wherein the film is characterized by disordered porosity, lacking a regular geometric arrangement of pores, and characterized by an x-ray diffraction peak between about 0.75 and about 2 degrees 2-theta or by the absences of an x-ray diffraction peak in the range of 2-6 degrees 2-theta;.

76. (Previously Presented) The dielectric film of claim 75, wherein the silica precursor solution includes one or more of methyl and ethyl groups.

77. (Previously Presented) The dielectric film of claim 75, wherein the silica precursor solution includes one or more of alkyl and phenyl groups.

78. (Currently Amended) The dielectric film having disordered porosity of claim 75, wherein the silica precursor solution includes carbon-containing groups.

79. (Currently Amended) ~~A~~ The dehydroxylated mesoporous silica film of claim 1, prepared from a surfactant containing silica precursor solution, wherein dehydroxylation of the porous film comprises the following steps:

- a. exposing said porous film to a silane;
- b. removing gas-phase and physisorbed species from said porous film.

80. (Currently Amended) A dehydroxylated mesoporous silica film as recited in claim 79, wherein steps (a) and (b) are performed at least ~~once~~ twice.

81. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 79, wherein said gas-phase species and said physisorbed species are removed from said porous film by applying a vacuum on said porous film.

82. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 80 wherein said gas-phase species and said physisorbed species are removed from said porous film by applying a vacuum on said porous film.

83. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 79, wherein said gas-phase species and said physisorbed species are removed from said porous film by applying a flowing forming gas or inert gas.

84. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 80, wherein said gas-phase species and said physisorbed species are removed from said porous film by applying a flowing forming gas or inert gas.

85. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 79 wherein said surfactant containing silica precursor solution comprises alkyl-substituted silica precursors.

86. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 80, wherein said surfactant containing silica precursor solution comprises alkyl-substituted silica precursors.

87. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 81, wherein the surfactant containing silica precursor solution comprises alkyl-substituted silica precursors.

88. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 82, wherein the surfactant containing silica precursor solution comprises alkyl-substituted silica precursors.

89. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 83, wherein the surfactant containing silica precursor solution comprises alkyl-substituted silica precursors.

90. (Previously Presented) A dehydroxylated mesoporous silica film as recited in claim 84, wherein the surfactant containing silica precursor solution comprises alkyl-substituted silica precursors.

91. (Currently Amended) The dehydroxylated mesoporous silica film as recited in claim 1, wherein the silica precursor solution and the surfactant include carbon-containing groups.

92. (Canceled)